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ABSTRACT

This report contains guidelines to vocational/occupational instructors who are developing or evaluating curricula to train workers for entry into a particular job and guidelines for students to determine the competencies they must have to enter a particular job or group of jobs. It includes descriptions (job sheets) of forty-one jobs, with job functions and activities listed in the order of perceived priority. Job titles are grouped into eight major occupational categories: (1) labor, production agriculture; (2) equipment operation and repair; (3) landscape and nursery; (4) sales; (5) technical and quality control; (6) business and office; (7) managerial/supervisorial; and (8) professional. Each title is prefaced with a short introduction, has a brief description of the fringe benefits received by employees, and is keyed to the "Dictionary of Occupational Titles" coding system. Appendix A contains additional agricultural job titles not included in this study, and Appendix B contains brief descriptions of functions and activities of various agricultural occupations (e.g., sales, purchasing, public relations, education-extension work, and clerical-office). (CT)

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Emerging Occupations in Agriculture: Impact Upon Curriculum and People, Part II

Functions and Activities of Agricultural Personnel in Yolo County, 1979

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Cover Photographs: Jean Landeen
Jack Clark

Purpose of the Study

This document is prepared, first, as a guideline to vocational/occupational instructors who are developing or evaluating curricula to train workers for entry into a particular job, and, second, as a guideline which students might use to determine the competencies they must have to enter a particular job or group of jobs.

Introduction

During the past few years there have been numerous requests for the updating of a large study entitled "The Determination of Proper Allocation of Functions and Responsibilities of Institutions Providing Education in Agriculture," completed in 1970 by the senior author. Among other things, that early study, through interviews with nearly 5,000 employees, determined the major functions and activities of workers in 76 different jobs that require various degrees of competence in agriculture. In the past decade, many technological changes have occurred in agriculture, such as drip-irrigation, electronic tomato sorters, controls on the use of pesticides and herbicides, bulk-handling of produce, and the introduction of many labor-saving devices. Questions posed by agricultural educators were: How have such changes affected the farm and agricultural labor force? Are administrators of agricultural programs at secondary, community college, and four-year college levels aware of the changes in competence needed by workers in agriculture, and are those changes reflected in the curricula offered?

Funds from Subpart III of the Vocational Education Act of 1976 were obtained for a pilot study in Yolo County to check, among other things, changes that have occurred in the functions and activities performed by various categories of workers in agriculture. Interviews were conducted with 200 workers in agriculture, ranging from farm laborers through managers in agribusinesses. A criterion for selection of a particular job was that knowledge of plants, animals, or agricultural mechanics was essential for performing the job. The sample included 28 females and 172 males, 20% of whom were Mexican-Americans. About half were under 30 years old, and 14% were over 50 years old. Most (70%) were married, and most (64%) were parents. About half had only two, one, or no children, one-fourth had three, and one-fourth had four or more.

The group was about equally represented in each of nine of the twelve Dictionary of Occupational Job Titles classifications, which range from unskilled laborer through professional. Each interviewee was asked to describe the functions he/she was expected to carry out and then identify the activities performed in

carrying out those functions. Table 1 lists the job categories and the numbers of respondents interviewed in each.

Identified in the labor force in Yolo County were 25 of the 76 jobs in agriculture described in the previous study plus 16 additional job titles not in the original study. The present document includes descriptions of 41 jobs, including changes found since the 1970 study. It is felt that these job descriptions are generalizable to other counties that have large-scale production of grains, forages, fruit crops, tomatoes, sugar beets, and vegetables. The job descriptions do not include those dealing specifically with cotton, dairy livestock production and production of ornamental horticultural plants. For a list of the 35 job titles in the previous study not found in the Yolo County study, see Appendix A.

The functions and activities are listed in the order of perceived priority as interpreted from the employee interviews. To be listed, the function and activity had to be given by a minimum of 40-50% of those interviewed. See Appendix B for a more complete description of the function and activities.

As stated, the primary purpose of this document is to provide vocational/occupational instructors who are developing curriculum a macro-guideline for program development. Each job sheet, including functions and activities, is not intended as an objective outline for a single course. It is very likely that several courses should be established either concurrently or consecutively for training for a particular job. As an example, a crew foreman on a large farming operation will need training in the supervision of personnel and also in operation and repair of farm machinery since he must be capable of both directing his crew and teaching new employees how to handle their jobs. These guidelines, thus, should be used to establish training programs rather than single "one-shot" courses.

How to Use the Job Sheets

Over forty job-description guidelines or job sheets from 200 employee interviews are included. Job titles are grouped into eight major occupational categories, each prefaced with a short introduction. Included is a brief description of the fringe benefits (new since 1970) received by employees.

The job sheets include both the functions and activities of like jobs described in the 1970 study. Those identified for the first time in the Yolo County study are marked with two asterisks. Each of the major job titles is keyed to the Dictionary of Occupational Titles (DOT) coding system. That system,

TABLE 1

SUMMARY OF AGRICULTURAL EMPLOYEE
INTERVIEWS BY JOB CATEGORY, YOLO COUNTY PROJECT, 1979

Category	Number of Interviews
Labor, Production Agriculture	26
Equipment Operation and Repair	32
Landscape and Nursery	17
Sales	12
Technical and Quality Control	21
Business and Office	25
Managerial/Supervisorial	51
Professional	16
TOTAL	200

maintained by the Department of Labor, is an outgrowth of the need for a comprehensive body of standardized occupational information for purposes of job placement, employment counseling, occupational and career guidance, and labor market information.

The DOT was first developed in the mid-1930's, and the latest edition was published in 1977. It contains a nine-digit number code which provides a unique definition of a job. The first three digits identify a particular occupational group; the middle three digits identify worker functions in relation to DATA, PEOPLE, and THINGS; and the last three indicate the alphabetical order of titles within the six-digit code groups and thus differentiate a particular occupation from all others; that is, a number of occupations can have the same six-digit code but no two occupations can have the same nine digits.

DOT six-digit codes are assigned to the job titles within this study in order to supplement the current function and activity data and provide more information to the curriculum developer. Whenever different job titles have similar, if not the same, functions and activities, they are listed on the same job page and coded with the DOT separately. For specific illustration, a job is coded and explained below.

DOT #407.687 Farmworker, Diversified Group

FIRST DIGIT = OCCUPATIONAL CATEGORY--Agricultural, fisheries, and related occupations

SECOND DIGIT = OCCUPATIONAL DIVISION--Plant farming occupations

THIRD DIGIT = OCCUPATIONAL GROUP--Plant life and related service occupations

FOURTH DIGIT = WORK FUNCTION, DATA--Comparing

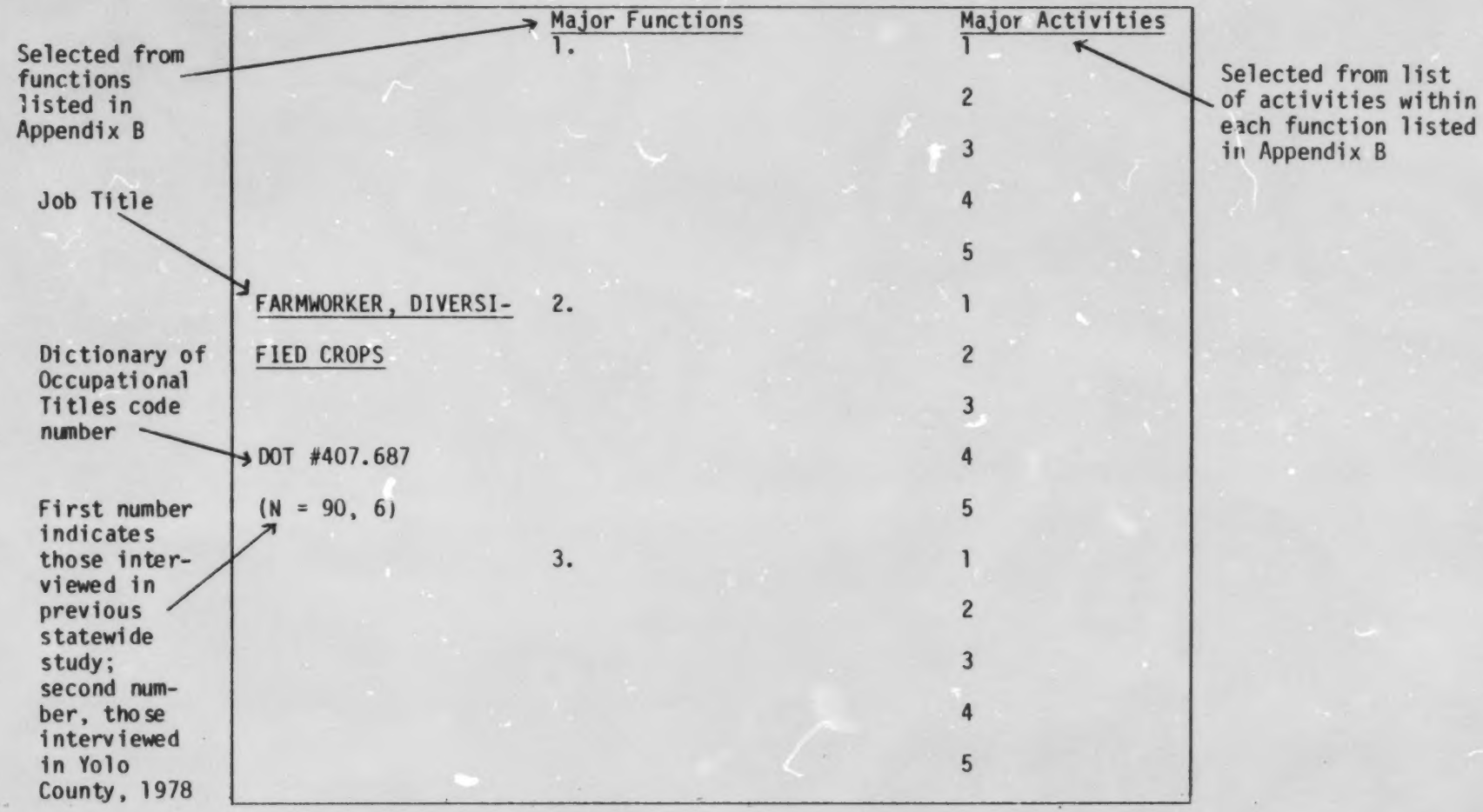
FIFTH DIGIT = WORK FUNCTION, PEOPLE--Taking instructions, helping

SIXTH DIGIT = WORK FUNCTION, THINGS--Handling

For the vocational education planner and the occupational counselor, information from other occupational coding systems may be necessary, e.g., The Census of the Population, 1970 Classified Index of Industries and Occupations (IOM), and the United States Office of Education (USOE) Vocational Education and Occupations Handbook. A cross code index (Cross Code Index, Vols. 1-4) of the different classifications has been developed by California Manpower Management Information System.

For further clarification of the job-sheet format used, see Figure 1, "Model of Job Sheet."

FIGURE 1 - MODEL OF JOB SHEET



NOTE: No asterisks before functions and activities statements indicate those identified solely by the 1970 statewide study and not in the Yolo County project.

* = Functions and activities identified by workers in Yolo County.

** = Functions and activities identified by workers in Yolo County but not by workers in previous study.

JOB SHEETS

I. LABORERS--PRODUCTION AGRICULTURE

I. LABORERS--PRODUCTION AGRICULTURE

Twenty-six of 200 employees interviewed were in the laborers job group. The following job titles were represented: farmworker, diversified crop; farmworker, general; farmworker, livestock; irrigator; and irrigation system installer. About half of these employees were seasonal, working four to ten months a year. Most of the seasonal workers were employed by the same employer every year. (As found also in the study in 1970, farmworker and irrigator are two job titles that were divided about equally between being year-around and seasonal employment.) The job title of irrigation-system installer was new in the Yolo Study and appears to be a year-around job. Half of the respondents in the laborers job grouping were from Mexican ancestry.

Little formal education is required by the jobs in this grouping. Sixty percent of those interviewed had less than a high-school education. All of the laborers stated that completion of high school was not necessary for their jobs, and nearly all said that education played no part in obtaining their jobs. Traditionally, educators have ignored this job grouping, yet, given the technological advances in agriculture, educators must not ignore the classification in the future. Over one-third of the laborers said they hoped to move to better jobs at their places of employment, specifically to jobs such as equipment operator or repairman. Both jobs require additional training and education. Employees also expressed interest in jobs with increased responsibilities.

Employees were also asked what types of changes they expected in their job in the next three to five years. It was predicted in the 1970 study that there would be a decrease in seasonal jobs and an increase in year-around employment, and that change was observed. More specifically, 46% of the laborers expected changes related to technological advances to affect their work. Few saw their jobs disappearing totally, however.

Of all the occupational groups interviewed, laborers were the most aware of state employment benefits such as disability insurance, worker's compensation, and unemployment insurance. Health insurance was the most frequently listed other fringe benefit (over 60%), with life insurance, transport, and paid vacations listed.

The major employers of laborers were farm operators who had field, tree, and/or row crops.

I. FARMWORKER, DIVERSIFIED CROP

DOT #407.687
(N = 15, 6)

Major Functions	Major Activities
*1. Growing of Plants	*1. Controlling weeds, pests, and diseases
	*2. Irrigating and draining
	*3. Soil tilling and land preparing
	*4. Harvesting
	*5. Pruning, thinning and training
	*6. Soil fertilizing-plant nutrition
	7. Propagating, planting, transplanting of plants
2. Construction, Maintenance, Repair, and Operation of Agricultural Machinery	1. Operating large gas engine equipment
	2. Operating diesel engine equipment
	3. Operating small gas engine equipment
	4. Adjusting and calibrating field equipment
	5. Maintaining large gas engines
	6. Setting up equipment for use
3. Handling of Agricultural Materials	1. Lifting and hoisting
	2. Positioning, weighing, and controlling
	3. Transporting
	4. Conveying
4. Supervision of Personnel	1. Directing the efforts of others
	2. Orienting new employees
	3. Training new employees
	4. Informing personnel regarding policy
	5. Improving the level of worker performance
5. Development of Air, Land, and Water Resources	1. Servicing irrigation systems
	2. Installing irrigation systems

I. FARMWORKER, GENERAL

DOT #407.663
(N = 26, 8)

Major Functions	Major Activities
*1. Growing of Plants	1. Soil tilling and land preparing
	*2. Irrigating and draining
	*3. Soil fertilizing--plant nutrition
	*4. Controlling weeds, pests, and diseases
	**5. Propagating, planting, transplanting
	6. Harvesting
	7. Pruning, thinning, training
*2. Construction, Maintenance, Repair, and Operation of Agricultural Machinery	*1. Operating large gas engine equipment
	*2. Adjusting and calibrating field equipment
	*3. Operating small gas engine equipment
	*4. Operating diesel equipment
	5. Determining suitability of equipment for particular job
	*6. Maintaining and minor repairing of small gas engines
	**7. Setting up equipment for use
	**8. Constructing structures and facilities
	**9. Establishing and maintaining records

I. FARMWORKER, LIVESTOCK

DOT #402.664
(N = 51, 4)

Major Functions	Major Activities
*1. Livestock and Poultry Production	*1. Cleaning of livestock facilities
	*2. Feeding livestock
	*3. Building and maintaining livestock facilities
	*4. Preventing, eradicating, and controlling diseases
	5. Animal altering
	6. Providing specialized care for young livestock
	*7. General caring of livestock for meat production
	**8. Deciding on amounts and kinds of feed
2. Construction, Maintenance, Repair, and Operation of Agricultural Machinery	1. Operating large gas engine equipment
	2. Operating small gas engine equipment
	3. Maintaining large gas engine equipment
	4. Adjusting and calibrating equipment for use
	5. Operating diesel equipment
	6. Setting up equipment for use
3. Growing of Plants	1. Irrigating and draining
	2. Soil tilling and land preparing
	3. Harvesting
	4. Soil fertilizing--plant nutrition
4. Handling of Agricultural Products	1. Lifting and hoisting
	2. Transporting
	3. Positioning, weighing, controlling
	4. Receiving agricultural products

I. IRRIGATOR

DOT #409.684
(N = 91, 5)

Major Functions	Major Activities
*1. Growing of Plants	*1. Irrigating and draining
	2. Controlling weeds, pests, diseases
	3. Soil tilling and land preparing
	4. Harvesting
	5. Pruning, thinning, training
	6. Soil fertilizing--plant nutrition
2. Construction, Maintenance, Repair, and Operation of Agricultural Machinery	1. Operating large gas engine equipment
	2. Operating small gas engine equipment
	3. Operating diesel equipment
	4. Setting up equipment for use
	5. Adjusting and calibrating field equipment for proper operation
3. Development of Air, Land, and Water Resources	1. Servicing irrigation systems
	2. Assessing water needs
	3. Installing irrigation systems
	4. Constructing dams and/or ponds

	Major Functions	Major Activities
I. **IRRIGATION SYSTEM INTALLER	**1. Construction, Maintenance, Repair, and Operation of Agricultural Machinery	**1. Setting up equipment for use **2. Adjusting and calibrating field equipment for proper operation
DOT #851.303 (N = 0, 4)	**2. Development of Air, Land, and Water Resources	**1. Servicing irrigation systems **2. Installing irrigation systems **3. Planning irrigation systems

II. EQUIPMENT OPERATION, REPAIR, AND/OR ASSEMBLY PERSONNEL

II. EQUIPMENT OPERATION, REPAIR, AND/OR ASSEMBLY PERSONNEL

The jobs in this category are involved in operation, repair, assembly, and construction of equipment and machinery, both on and off farms. The predominant titles found were equipment operator, general farm machinery; tractor operator; equipment welders and assemblymen; mechanic, general and/or diesel; and shop foreman. The two hundred workers interviewed included thirty-two equipment-related employees.

About 40% of the employees within the equipment-related category were seasonal workers, and over half were tractor or equipment operators. They worked four to eleven months a year (average, eight months). Most seasonal employees in this category worked for the same employer each year. Year-around employees in this category tended to be permanent employees. They averaged seven years on the job (range, one to twenty). Half the employees in the equipment-related category were of Mexican ancestry.

Over half of the employees in this category had high school diplomas, and some had formal training programs or a college degree. About one in five had attended California community colleges, and one in seven had been in a formal training program. Although the educational level was higher for this job category than for the laborer, fewer felt that special education was needed to obtain their jobs; in fact, over 70% indicated that only some high-school education or less was all that was necessary. Within the various job titles, differences were noted between the employees in their feelings about educational requirements. In general, tractor and equipment operators did not feel that completion of high school was necessary. Equipment and machinery repairmen did feel the need for a high-school diploma.

Although few employees felt that education beyond high school was necessary, over one-third commented on the need for practical work experience. In fact, 65% of the employees cited on-the-job training as necessary for their employment. Only 20% had had the benefit of apprenticeship training.

Sixty percent of the employees foresaw many technological changes in their jobs in the next three to five years. Over one-third recognized the need for additional technical training in the operation and repair of advanced modern equipment. No one saw his job disappearing as a result of future changes. Nearly half of the employees expected to move to better jobs either with their present employer or with another agricultural employer. When asked, if given a choice would you stay or leave the agricultural occupational field, 60% would stay in agriculture.

II. EQUIPMENT OPERATION, REPAIR, AND/OR ASSEMBLY PERSONNEL (Continued)

As a major job category, the equipment-related employees listed few fringe benefits associated with their work. Health insurance was the only fringe benefit that over 65% reported receiving. Between 35% and 45% received paid holidays, sick leave, or vacations. About half were aware of state benefits such as disability and unemployment insurance, but only one in eight was aware of workman's compensation. One in five received a year-end bonus as a fringe benefit.

Employees in the five major job titles of this grouping are found on both farm and nonfarm segments of the industry. Equipment and tractor operators, both seasonal and year-around, are found mainly in farming operations. Repair workers are found on farms and related businesses, primarily in equipment sales.

II. EQUIPMENT OPERATOR, GENERAL

DOT #409.683
(N = 44, 6)

Major Functions	Major Activities
*1. Construction, Maintenance, Repair, and Operation of Agricultural Machinery Machinery	*1. Adjusting and calibrating field equipment for proper operation
	*2. Operating large gas engine equipment
	*3. Operating diesel equipment
	*4. Setting up equipment for use
	*5. Operating small gas engine equipment
	*6. Maintaining large gas engines
	**7. Maintaining small gas engines
	**8. Maintaining diesel engines
	**9. Constructing equipment
	**10. Determining suitability of equipment for particular jobs
2. Growing of Plants	1. Harvesting
	2. Soil tilling and land preparing
	3. Soil fertilizing--plant nutrition
	4. Preventing, eradicating, and controlling weeds, pests, and diseases
3. Handling of Agricultural Materials	1. Conveying
	2. Positioning, weighing, and controlling
	3. Lifting and hoisting
	4. Transporting

	Major Functions	Major Activities
	*1. Construction, Maintenance, Repair, and Operation of Agricultural Machinery	*1. Operating large gas engine equipment *2. Operating diesel equipment *3. Adjusting and calibrating field equipment *4. Setting up equipment for use *5. Operating small gas engine equipment *6. Maintaining large gas engine equipment *7. Maintaining diesel equipment *8. Maintaining small gas engines
II. TRACTOR OPERATOR, GENERAL DOT #929.683 (N = 120, 9)	*2. Growing of Plants	*1. Soil tilling and land preparing 2. Controlling weeds, pests, and diseases *3. Soil fertilizing--plant nutrition *4. Harvesting 5. Planting and transplanting plants *6. Pruning, thinning, and training
	3. Handling of Agricultural Materials	1. Lifting and hoisting 2. Transporting 3. Positioning, weighing, controlling 4. Conveying
	4. Development of Air, Land, and Water Resources	1. Land leveling 2. Constructing drainage systems 3. Servicing irrigation systems 4. Installing irrigation systems
	5. Supervision of Personnel	1. Directing effort of others 2. Training new employees 3. Orienting new employees to job

	Major Functions	Major Activities
	*1. Construction, Maintenance, Repair, and Operation of Agricultural Machinery	*1. Constructing equipment *2. Setting up equipment for use *3. Designing equipment 4. Constructing structures and facilities *5. Determining suitability of equipment for particular jobs *6. Adjusting and calibrating field equipment 7. Operating large gas engine equipment 8. Designing structures
II. EQUIPMENT WELDER/ ASSEMBLYMAN DOT #819.384/ DOT #819.687 (N = 18, 6)	2. Supervision of Personnel	
	3. Processing and Packaging of Agricultural Products	

II. MECHANIC, GENERAL/DIESEL

DOT #624.281/
DOT #625.281
(N = 51, 8)

Major Functions	Major Activities
*1. Construction, Maintenance, Repair, and Operation of Agricultural Machinery	*1. Maintaining and repairing large gas engines
	*2. Performing major overhaul of gas engines
	*3. Maintaining and repairing small gas engines
	*4. Setting up equipment for use
	*5. Adjusting and calibrating field equipment
	*6. Performing major overhaul of diesel equipment
	*7. Operating small gas engine equipment
	*8. Operating large gas engine equipment
	**9. Operating diesel engine equipment
	**10. Establishing, maintaining service and operation records
2. Supervision of Personnel	1. Directing effort of others
	2. Training new employees
	3. Orienting new employees to job
	4. Rating personnel in terms of performance
3. Growing of Plants	1. Soil tilling and land preparing
	2. Harvesting
	3. Planting and transplanting plants
	4. Eradicating, controlling and preventing weeds, pests, and diseases

II. **SHOP FOREMAN

DOT #624.131
(N = 0, 3)

Major Functions

**1. Construction, Maintenance, Repair, and Operation of Agricultural Machinery

**2. Supervision of Personnel

Major Activities

**1. Maintaining and minor repairing of small and large gas engines
**2. Maintaining diesel engines
**3. Adjusting and calibrating field equipment for proper operation
**4. Operating small and large gas engine equipment
**5. Designing equipment
**6. Constructing equipment
**7. Setting up equipment for use (install, establish, and service)
**8. Determining suitability of equipment for particular jobs
**9. Establishing and maintaining a record system for maintenance, service, operation, and repair

III. LANDSCAPE AND NURSERY PERSONNEL

III. LANDSCAPE AND NURSERY WORKERS

Although the landscape and nursery business is a major agricultural employer in California, it is not a large industry in Yolo County. Our sample contained seventeen employees from this industry, representing four different job titles: nursery worker; gardener or landscape worker; and landscape designer and contractor. All were employed the year around. Of the seventeen, only one had been working at the same job for more than five years, eleven had worked on the same job two to five years, while seven had less than one year. This suggests a flow-through in this job category.

The educational level was much higher for this job category than for the laborers and equipment-related groups. Completion of high school appears to be a necessity, for all had high-school diplomas. Thirteen (76%) had some college, half (47%) had four-year college degrees, and one had completed some graduate college work. Two had attended the University of California, two were graduates of a California State University, three had out-of-state degrees, and three had community college degrees. The four high-school graduates had been schooled locally. Also, contrary to laborers and machine operators, education was a major factor in obtaining their jobs. Some, however, indicated they were overqualified for what they were doing at this time. For example, while about half had college degrees, only one in four felt that level of training to be necessary.

The subject-matter areas considered most important by these workers were English, speech, mathematics, and business. Production practices in horticulture, including propogation and disease control, were felt to be necessary knowledge.

About 60% of the interviewees said they would (but possibly could not) move to better jobs within their present companies, for they were already at the highest level possible. Many desired to manage their own firm. Only two said they planned to leave the ornamental-horticulture field. Most (58%) were satisfied with their job, while about a third wished to move to better jobs in their field. They do not foresee much change in landscape and nursery jobs other than the effects of business expansion.

They listed few fringe benefits associated with their jobs. Paid vacation time was the only benefit that over two-thirds of the employees noted. Paid holidays were received by about half, and paid sick leave and health insurance was available to about 40%. Guaranteed state benefits were mentioned by a few employees, indicating possible unawareness of the various state employment benefits for which they qualified.

III. NURSERY WORKER

DOT #405.687
(N = 20, 9)

Major Functions		Major Activities	
*1.	Growing of Plants	*1.	Pruning, thinning, training
		*2.	Propagating, planting, transplanting
		*3.	Soil fertilizing--plant nutrition
		*4.	Controlling weeds, pests, and diseases
		*5.	Irrigating and draining
		*6.	Soil tilling and land preparing
		**7.	Plant breeding, selecting, reproducting
		**8.	Weather modifying for plant production
*2.	Environmental Horticulture	*1.	Caring of plants in containers indoors
		*2.	Caring of plants in containers outdoors
		3.	Caring of cut plant material
		*4.	Nursery operating and managing
		**5.	Turf managing
		**6.	Landscape designing
		**7.	Landscape gardening
		**8.	Growing plants for ornamental horticultural use
		**9.	Greenhouse operating and managing
3.	Handling of Agricultural Materials	1.	Lifting and hoisting
		2.	Receiving
		3.	Storing
		4.	Conveying
		5.	Positioning, weighing, controlling
		6.	Transporting (carrier handling)
*4.	Sales	**1.	Demonstrating: showing, explaining, illustrating
		*2.	Acquiring product knowledge or skill competence
		*3.	Identifying target groups or individuals
		*4.	Learning and using selling techniques
		*5.	Estimating and interpreting needs of prospective buyers
		*6.	Diagnosing the opportunities for sales
		**7.	Planning a course of action

	Major Functions	Major Activities
		**8. Preparing guidelines for sale program
		**9. Developing information customers need
		**10. Advertising
		**11. Completing financial transactions
		**12. Providing for continued service
		**13. Checking on customer results
	5. Supervision of Personnel	1. Directing efforts of others
		2. Training new employees
		3. Orienting new employees to their jobs
		4. Developing and maintaining high level of morale

III. NURSERY WORKER (Continued)

DOT #405.687
(N = 20, 9)

III. GARDENER, LANDSCAPE WORKER

DOT #408.687
(N = 10, 2)

Major Functions	Major Activities
*1. Environmental Horticulture	*1. Landscape gardening
	2. Landscape designing
	*3. Caring for plants in containers indoors and outdoors
	**4. Growing of plants for ornamental horticultural use
2. Handling of Agricultural Materials	1. Conveying
	2. Lifting, hoisting
	3. Transporting (carrier handling)
*3. Construction, Maintenance, Repair, and Operation of Agricultural Machinery	1. Setting up equipment for use
	*2. Operating small gas engine equipment
	3. Operating large gas engine equipment
	4. Operating diesel equipment
	**5. Maintaining small gas engines
*4. Growing of Plants	*1. Soil tilling and land preparing
	*2. Propagating, planting, and transplanting of plants
	*3. Controlling weeds, pests, and diseases
	*4. Pruning, thinning, and training
	*5. Soil fertilizing--plant nutrition
	**6. Irrigating and draining

	Major Functions	Major Activities
	**1. Environmental Horticulture	**1. Landscape designing **2. Landscape contracting **3. Using landscape architecture **4. Landscape gardening
	**2. Supervision of Personnel	**1. Directing the efforts of others **2. Orienting and training new employees **3. Developing and maintaining a high level of morale
III. **LANDSCAPE DESIGNER AND CONTRACTOR DOT #408.161/ DOT #182.167 (N = 0, 6)	**3. Sales	**1. Estimating and interpreting the needs of the prospective buyer **2. Demonstrating **3. Checking on results obtained from customers **4. Providing for continued service, education, and goodwill **5. Developing information regarding prospectivec needs of customers **6. Learning and using accepted selling techniques
	**4. Consultation and Advisement	
	**5. Administration and Management	
	**6. Growing of Plants	

IV. SALES PERSONNEL

IV. SALES PERSONNEL

Most of the workers in this category are in farm-related businesses such as chemical, seed, and equipment sales companies. Also, some sales jobs were found in horticultural businesses and agricultural service businesses. The predominant titles were field representative, sales; and salesperson, field or route. Twelve employees were interviewed in this category, and all but one were employed year-around; only one was of Mexican ancestry.

The level of education of sales employees varied; 42% had completed a baccalaureate degree, one in four had some college or formal training, and one in six was a high-school graduate only. One employee had some graduate work, and one was a high-school dropout. As a group, sales personnel feel the need for education to a much greater degree than laborers and operators. Nearly all saw completion of high school as essential. One-third recommended a four-year college degree, and a like number saw the associate degree as a minimum. Licensing is now required for herbicide and pesticide salesmen, and that requires formal course work and inservice training. To date, sales in horticulture products have no license requirements. Many employees noted the importance of an agricultural background or a basic familiarity with agriculture as qualifications for agricultural sales.

The respondents felt that academic preparation was needed for sales work. Most listed the following as somewhat to highly necessary for job entry: speech, English, mathematics, physical and biological sciences, business, and agricultural production.

The sales employees listed the greatest number of fringe benefits of all the job categories. Paid vacations, holidays, sick leave, and health insurance were employment benefits listed by over 75% of the respondents. Profit sharing, transport, and life insurance were listed by over half, and over 40% were aware of the state employee benefits.

Job contentment was not universal in this category. Over half said they would look for a better job in agriculture, and 40% said they would stay on the same type of work. When asked about moving to a better job in the present company, about half saw an opportunity, especially in management.

Recent changes in the functions and activities of sales work relate to new and/or additional governmental regulations (especially for the pesticide and chemical sales and application) and technology as it affects new farm-related equipment. No one felt his job was in danger of disappearing from such changes.

IV. FIELD REPRESENTATIVE, SALES

DOT #162.117
(N = 4, 4)

Major Functions	Major Activities
*1. Sales	*1. Acquiring product knowledge or skill competence
	*2. Developing information for needs of prospective customers
	3. Providing for continued service, education, and goodwill
	4. Checking on results obtained by customers
	5. Preparing guidelines for sales program
	6. Identifying target groups and individuals
	*7. Learning and using selling techniques based on accepted principles
	*8. Demonstrating products
	9. Diagnosing opportunities for sales
	*10. Providing complete and acceptable records of sales program
	**11. Planning course of activity
	**12. Estimating and interpreting needs of prospective buyers
2. Administration and Management	1. Financing--providing or arranging for funds, capital, and credit for customers
3. Research and Development	1. Identifying problem areas
	2. Planning a course of action
	3. Selecting research method appropriate to investigation
4. Clerical-Office	1. Preparing correspondence and communications
	2. Preparing office reports, records, inventories
*5. Growing of Plants	*1. Erradicating, preventing, and controlling weeds, pests, and diseases
	**2. Soil fertilizing--plant nutrition

IV. FIELD REPRESENTATIVE, SALES (Continued)

DOT #162.117
(N = 4, 4)

Major Functions	Major Activities
**6. Handling of Agricultural Materials	**1. Transfering of agricultural materials
	**2. Storing and warehousing
*7. Consultation and Advisement	*1. Setting goals and objectives
	*2. Determining ways and means
	*3. Evaluating
	*4. Dealing with operational and technical details regarding: a) Conserving, developing and improving land, air, and water for agricultural purposes b) Accounts, records, bookkeeping, and budgets c) Public relations d) Labor e) Law
*8. Public Relations	*1. Meeting potential business associates socially
	*2. Making public appearances--presenting talks, lectures, demonstrations
	*3. Visiting agriculturalists in field of related endeavor and learning relationships
	*4. Meeting and cooperating with others in developing solutions in agricultural problems
	*5. Assisting in the promotion, preparation, distribution, and using informational materials

IV. SALESPERSON, FIELD OR ROUTE

DOT #272.357
(N = 76, 8)

Major Functions	Major Activities
*1. Sales	*1. Learning and using selling techniques
	2. Providing for continued service, education and goodwill
	*3. Acquiring product knowledge and skill competence
	*4. Developing information regarding needs of prospective customers
	*5. Estimating and interpreting the needs of prospective buyers
	6. Diagnosing the opportunities for sales
	**7. Planning a course of action
*2. Public Relations	*1. Meeting potential business associates socially
	2. Meeting and cooperating with others in developing solutions to agricultural problems
	3. Visiting agriculturalists in field of related endeavor and learning relationships
	4. Providing non-business services to business associates
	5. Determining effectiveness of efforts
	**6. Deciding on ways and means
	**7. Taking inventory and allocating resources for effective public relations program
	**8. Assisting in promotion, preparation, distribution and use of informational material
	**9. Recommending the names of persons available as resources
3. Consultation and Advisement	1. Providing others with expertise and information on operational and technical details regarding: production and public relations

	Major Functions	Major Activities
		3. Recognizing limitations, problems, and obstacles
		4. Evaluating, planning, and decision-making
		5. Setting goals and objectives
	4. Communications and Writing	1. Gathering and recording field data
		2. Writing reports for submission to higher authority
		3. Making public talks, lectures, demonstrations, etc.
IV. SALESPERSON, FIELD OR ROUTE (Continued)	*5. Clerical-Office	*1. Preparing office reports, records, and inventories
DOT #272.357		2. Preparing correspondence and communications
(N = 76, 8)		3. Operating office machines and communication devices
		*4. Engaging in office sales
	6. Marketing of Agricultural Products	1. Selecting market outlets
		2. Selling agricultural products wholesale
	**7. Administration and Management	**1. Planning
		**2. Organizing
		**3. Making or formulating policy
		**4. Coordinating

V. TECHNICIANS AND QUALITY-CONTROL PERSONNEL

V. TECHNICIANS AND QUALITY-CONTROL PERSONNEL

Two types of workers are included in this category. There is overlap in the functions and activities of technician jobs and quality-control jobs, making the two groups difficult to separate. Both types of employees take samples, make tests, and evaluate results.

Six titles are included: sampler; technician-laboratory, plant, research; quality-control specialist; agricultural biologist; field-crop inspector; and quality-control supervisor. The quality-control specialist, agricultural biologist, and field-crop inspector, having relatively the same functions and activities, are grouped together on the same descriptive sheet and have the same DOT code. Which title is used seems to depend on the employing company.

Twenty-one employees in this category were interviewed. The job title field inspector is basically a seasonal job, mainly requiring a high school diploma and previous agricultural experience. In Yolo County, this type of job is often held by college students during the growing season.

The variety of job titles in this category make educational requirements difficult to define. As a group, educational attainment is high. One-third had some college or formal training and a like number held a baccalaureate, while one in four had graduate work or a graduate degree. Only two had terminated their formal education at high school. Many found they were overqualified for their jobs. Forty-three percent felt that high school was adequate preparation for their jobs, while one-fourth indicated that some college or formal training was necessary. One-third mentioned a four-year college degree. Overqualification for present employment could be a reflection of the job market and/or could reflect the employers' desire to have employees eligible for promotion within the company.

The subject-matter preparation deemed most important by 75% in this job category was in speech, English, mathematics, physical sciences, biological sciences, and agricultural production. The type of agricultural production considered most valuable is knowledge of crops, plant diseases, and a general understanding of plant growth.

One-half of the technicians and quality-control workers see no change in their work in the years ahead. The other half see changes created by a growing number of governmental regulations. No employee felt that these changes would cause their jobs to be eliminated.

The technicians and quality-control personnel in the sample were employed mostly by state and county agricultural regulatory agencies and by private product-development firms. Several technicians were employed in research activities at public institutions.

V. **SAMPLER

DOT #922.687
(N = 0, 3)

Major Functions	Major Activities
**1. Inspection, Enforcement, Regulation, and Control	**1. Inspecting and examining agricultural products
	**2. Standardizing agricultural products
**2. Construction, Maintenance, Repair, and Operation of Agricultural Machinery	**1. Adjusting and calibrating field equipment for proper operation
	**2. Operating small gas engines
	**3. Determining suitability of equipment for particular jobs
	**4. Establishing and maintaining record system for maintenance, service, operation and repair

	Major Functions	Major Activities
	1. Inspection, Enforcement, Regulation, and Control	1. Inspecting and examining agricultural products 2. Controlling agricultural products 3. Analyzing agricultural programs 4. Standardizing agricultural products
	*2. Supervision of Personnel	*1. Orienting new employees to their job *2. Training new employees *3. Directing efforts of others *4. Improving worker performance and stimulating growth
V. TECHNICIANS-LABORATORY, PLANT, RESEARCH DOT #029.261 (N = 22, 6)	3. Research and Development	1. Obtaining pertinent information relevant to a particular situation 2. Examining, checking, testing against established standards 3. Seeing if something works by experiment or trial
	4. Clerical-Office	1. Preparing office reports 2. Operating office machines
	5. Communication and Writing	1. Gathering and recording field data 2. Writing reports for submission to higher authority
	*6. Growing of Plants	*1. Harvesting *2. Propagating, planting, and transplanting of plants *3. Controlling weeds, pests, and diseases *4. Soil tilling and land preparing *5. Soil fertilizing--plant nutrition
	*7. Construction, Maintenance, Repair, and Operation of Agricultural Machinery	

	Major Functions	Major Activities
V. QUALITY CONTROL SPECIALIST/ **AGRICULTURAL BIOLOGIST/ FIELD CROP INSPECTOR DOT #168.287 (N = 31, 7)	*1. Inspection, Enforcement, Regulation, and Control	*1. Inspecting and examining agricultural products *2. Standardizing agricultural products 3. Controlling agricultural products *4. Grading of agricultural products *5. Protecting consumers *6. Certificating agricultural products **7. Enforcing agricultural programs
	*2. Supervision of Personnel	1. Developing and maintaining a high level of morale 2. Orienting new employees to job 3. Improving worker performance and stimulating growth 4. Interviewing prospective employees 5. Training new employees 6. Directing efforts of others 7. Informing personnel of firm policy, plans
	3. Communications and Writing	1. Writing reports for submission to higher authority 2. Making public talks, educational visits
	4. Processing and Packing Agricultural Products	1. Interpreting rules, laws, regulations 2. Trouble shooting programs as they arise 3. Analyzing and evaluating--reviewing results of programs
	5. Administration and Management	1. Coordinating 2. Evaluating 3. Promoting
	6. Clerical-Office	1. Preparing correspondence and communications 2. Preparing office reports, records, inventories 3. Operating office machines

V. QUALITY CONTROL SPECIALIST/
**AGRICULTURAL BIOLOGIST/
FIELD CROP INSPECTOR
(Continued)

DOT #168.287
(N = 31, 7)

Major Functions	Major Activities
**7. Construction, Maintenance, Repair, and Operation of Agricultural Machinery	**1. Adjusting and calibrating field equipment **2. Determining suitability of equipment for particular jobs

V. SUPERVISOR, QUALITY CONTROL-INSPECTION

DOT #408.137
(N = 14, 5)

Major Functions	Major Activities
*1. Inspection, Enforcement, Regulation, and Control	*1. Inspecting and examining agricultural products
	*2. Certificating agricultural products
	*3. Administrating agricultural programs
	*4. Grading agricultural products
	*5. Enforcing agricultural programs
*2. Supervision of Personnel	*1. Orienting and training new employees
	*2. Directing the efforts of others
	*3. Developing and maintaining a high level of morale
	*4. Hearing and processing worker grievances
	*5. Informing personnel regarding firm policy and plans
	*6. Terminating employment of workers when necessary
*3. Administration and Management	*1. Promoting
	*2. Planning
	*3. Organizing
	*4. Evaluating
*4. Communications and Writing	*1. Writing reports for submission to higher authority

VI. BUSINESS AND OFFICE PERSONNEL

VI. BUSINESS AND OFFICE PERSONNEL

Although business and office workers are usually not considered "agricultural workers," many employers and employees consider knowledge about agricultural production to be important for business and office personnel employed on farms or in agribusiness.

Twenty-five employees were interviewed in this job category, representing the following titles: secretary; bookkeeper; office manager; buyer; grain merchant; and loan officer, agricultural.

Agribusiness-related jobs outnumbered on-farm jobs in this category. Most jobs are found in larger operations in both areas, although it is not uncommon for a wife to hold an office type of job in a small operation.

Most (90%) of those in the office job titles were women, the sole category in which women were the majority. The only other categories with more than one or two women were labor (4), landscape/nursery (3), and technicians--quality control (3). All employees in this category worked the year around.

Nearly all of this group (88%) had attended college, and of these, one-third had four-year degrees and three had had graduate-level work. Only three had terminated schooling at the secondary level. As one might expect, those in the business aspect of a company, rather than clerical, were more likely to be college educated. Education was considered a major factor for job entry for those in business-office work.

About half of the clerical personnel felt that education was a major factor for job entry. When asked how much education was needed for their present job, 75 percent said high school or less. The remaining 25% saw either some college or a college degree necessary--these employees had bookkeeping and/or office-management responsibilities.

The subject-matter areas considered most necessary for this category were mathematics, speech, English, and business. Also considered highly or somewhat necessary by over 70% of the respondents were business management, labor management, and agricultural production.

Business personnel expressed a high degree of job satisfaction: all wanted to stay in agriculture if given the opportunity. All also were interested in progressing into better jobs with their firms. Job satisfaction for office personnel was considerably less, for nearly 40% would move out of their jobs in agriculture if given the opportunity.

VI. BUSINESS AND OFFICE PERSONNEL (Continued)

No major job changes were anticipated by the respondents in th[illegible] category. Some wished to move into positions with more authority and responsibility.

The benefits listed most frequently (by over 80%) were paid vacations, holidays, sick leave, and health insurance. A few received dental and life-insurance benefits.

VI. BOOKKEEPER

DOT #210.382
(N = 60, 7)

Major Functions	Major Activities
*1. Clerical-Office	*1. Preparing office reports, records, inventories
	*2. Preparing financial accounts, books, budgets, operating statements
	*3. Operating office machinery
	*4. Keeping materials and office records
	*5. Keeping employee records
	*6. Purchasing and/or requisitioning office supplies
	*7. Preparing correspondence and communications
	*8. Handling money and making deposits
	**9. Duplicating and reproducing written or printed materials
2. Supervision of Employees	
3. Administration and Management	
4. Communication and Writing	

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VI. SECRETARY

DOT #201.362
(N = 67, 6)

Major Functions	Major Activities
*1. Clerical-Office	*1. Preparing correspondence and communications
	*2. Operating office machinery and communication devices
	*3. Preparing office reports, records, inventories
	*4. Acting as receptionist and scheduling appointments
	*5. Purchasing and/or requisitioning office supplies
	*6. Duplicating and reproducing written or printed materials
	*7. Keeping materials and production records
	**8. Keeping employee records
	**9. Handling money and making deposits
2. Supervision of Personnel	1. Orienting new employees to job
	2. Training new employees
	3. Directing efforts of others
	4. Informing personnel of policy and plans
	5. Developing and maintaining high level of morale
3. Public Relations	1. Providing non-business services to business associates
	2. Determining effectiveness of efforts
	3. Assisting in promotion, preparation, distribution of informational materials
	4. Recommending names of persons available as agricultural resource persons
4. Administration and Management	1. Evaluating
	2. Organizing
	3. Coordinating
	4. Planning
	5. Promoting
5. Communications and Writing	1. Writing reports for submission to higher authority
	2. Writing reports and accounts, brochures, etc.
	3. Gathering, preparing, editing, and disseminating general agricultural information and news in newspaper and magazine form
	4. Gathering and recording field data

	Major Functions	Major Activities
	*1. Clerical-Office	*1. Preparing correspondence and communications
		*2. Operating office equipment and communication devices
		*3. Preparing office reports, records, and inventories
		*4. Purchasing and/or requisitioning office supplies
		*5. Preparing financial accounts, books, budget, and operating statements
		*6. Keeping materials and production records
VI. OFFICE MANAGER		*7. Keeping employee records
DOT #169.167 (N = 121, 2)	*2. Supervision of Personnel	*1. Directing the effort of others
		*2. Orienting new employees to their job
		*3. Informing personnel of firm policy, plans
		*4. Improving level of worker performance
		*5. Hearing and processing worker grievances
		*6. Interviewing prospective employees
		*7. Developing and maintaining morale
	*3. Administration and Management	*1. Organizing
		*2. Coordinating
		3. Planning
		4. Evaluating
		*5. Making or formulating policy
		6. Promoting
		**7. Negotiating
	4. Purchasing	1. Procuring goods or services
		2. Determining needs
		3. Choosing and selecting according to specifications
		4. Determining needs or estimating prices
	*5. Communications and Writing	*1. Writing reports for submission to higher authority
		*2. Gathering and recording field data
		*3. Writing reports and accounts, circulars, brochures, etc.

	Major Functions	Major Activities
	6. Public Relations	1. Meeting potential business associates socially 2. Determining effectiveness of efforts 3. Meeting and cooperating with others in developing solutions to agricultural problems
VI. OFFICE MANAGER (Continued) DOT #169.167 (N = 121, 2)	7. Sales	1. Completing financial transactions 2. Acquiring product knowledge or skill competence 3. Providing continued services, education, goodwill

	Major Functions	Major Activities
VI. **BUYER/ **GRAIN MERCHANT DOT #162.167/ DOT #162.157 (N = 33, 4)	**1. Sales	**1. Planning a course of action **2. Acquiring product knowledge of skill competence **3. Identifying target groups and individuals **4. Estimating and interpreting the needs of the prospective buyer **5. Completing financial transactions **6. Providing for continued service, education, and goodwill **7. Checking on results obtained by customer **8. Providing complete and acceptable records of sales program
	**2. Purchasing	**1. Setting goals **2. Choosng-selecting according to specification **3. Purchasing **4. Delivering
	**3. Marketing of Agricultural Products	**1. Selecting market outlets for agricultural products **2. Forecasting prices of agricultural products **3. Selling agricultural products wholesale
	**4. Administration and Management	**1. Coordinating **2. Evaluating **3. Negotiating
	**5. Public Relations	

	Major Functions	Major Activities
VI. **LOAN OFFICER/ ANALYST, AGRICULTURAL DOT #186.267 (N = 13, 5)	**1. Administration and Management	**1. Financing and arranging for credit, capital, or funds for customers **2. Planning and formulating goals, designing project methods **3. Coordinating and relating various aspects of programs and activities **4. Organizing and systematizing **5. Evaluating and determining values, assessing, rating, and judging
	**2. Finance and Lending	**1. Appraising properties and chattels for security **2. Recommending loans **3. Preparing loans **4. Approving loans **5. Rejecting loans
	**3. Public Relations	**1. Making public appearances--presenting talks, lectures, demonstrations **2. Visiting agriculturalists in fields of related endeavor **3. Meeting potential business associates socially **4. Engaging in informal public relations activities--providing non-business services to business associates
	**4. Communications and Writing	**1. Writing reports for submission to higher authority **2. Making public talks, lectures and educational visits **3. Gathering and recording field data

VII. MANAGERIAL AND SUPERVISORIAL PERSONNEL

VII. MANAGERIAL AND SUPERVISORIAL PERSONNEL

Fifty-one employees were interviewed in two general sectors--farm production and related agribusinesses--making managerial/supervisorial the largest job category. Job titles found in farm production were: foreman, crew, and farm/ranch manager. In the business-related sector, titles interviewed were: foreman, general; field representative, processing plant; manager, processing plants, agricultural-related business; parts manager; and service manager.

Although the functions of the jobs listed are similar, the number and level of activities differ. Twenty-one employees were in the farm production sector, of which one-third had seasonal positions. Most seasonal jobs were crew foremen, which ranged from five to eleven months in length. Although the work was seasonal, all employees returned to the same farm year after year, with their tenure ranging from four to thirty-two years. No other title within the category was seasonal.

Those employed as foremen had less education than managers. They felt that less education is required for their jobs. Only two of the foremen had any college preparation, and only 30% were high-school graduates. The remaining two-thirds had less than a high-school education. One-third of the foremen (7) were of Mexican ancestry. In contrast, over half of the managers had college degrees or graduate education, and the remainder had had some college work.

Thirty employees were interviewed in the related-business sector. With these respondents, educational attainment was sustantially greater than for those in the production sector. Two in three had four-year college degrees, and of this group a third had done graduate work. Another one in five had some college preparation, and the remainder had high school or less. Most of this group, when asked the educational level necessary for their job, gave answers close to the above. Few felt they were underemployed, and half indicated that their educational background was critical in getting the position now held.

In responding to the specific areas of education needed, the managers and supervisors were heavy on business-related subjects, such as business management, labor management, and agricultural production. Spanish and speech were mentioned by over 60% of the respondents.

Job satisfaction was high among the employees in this category. Most (88%) said they would stay in agriculture rather than move into another area. Nearly half planned to stay on their present job, and a like number would consider a better job if it was in agriculture.

VII. MANAGERIAL AND SUPERVISORIAL PERSONNEL (Continued)

Many (66%) foresaw changes their jobs in the next three to five years, due mainly to technological factors. Many felt there would also be changes due to expansion. The technological changes they foresaw included new developments in chemical application, advanced equipment and machinery, and computer business management skills.

Health insurance was the employee benefit mentioned most often (90%). Two-thirds to three-fourths mentioned paid vacations, paid holidays, sick leave (65%), and assistance in transport.

The positive aspects of their jobs mentioned most frequently were: freedom, challenge, variety, and being outdoors. Field representatives tended to mention freedom and travel, and managers were high on variety and challenge of the job. Love of agriculture and farming was a characteristic common for all in the job category.

VII. FOREMAN, CREW

DOT #180.167
(N = 216, 9)

Major Functions	Major Activities
*1. Supervision of Personnel	*1. Directing the efforts of others
	*2. Training new employees
	*3. Orienting new employees to job
	*4. Improving the level of worker performance
	*5. Hearing and processing worker grievances
	6. Rating personnel in terms of performance
	*7. Informing personnel regarding firm policy and plans
	**8. Hiring new employees
	**9. Retraining experienced employees
	**10. Developing and maintaining high level of morale
2. Construction, Maintenance, Operation, and Repair of Agricultural Machinery	1. Determining suitability of equipment for particular jobs
	2. Setting up equipment for use
	3. Adjusting and calibrating field equipment for proper operation
	4. Operating large gas engine equipment
	5. Operating small gas engine equipment
	6. Maintaining and minor repairing of small gas engine equipment
*3. Growing of Plants	*1. Harvesting
	2. Setting up equipment for use
	3. Soil tilling and land preparing
	4. Controlling weeds, pests, and diseases
	5. Irrigating and draining
	6. Soil fertilizing--plant nutrition
	**7. Pruning, thinning, and training
*4. Handling of Agricultural Materials	
5. Processing and Packing of Agricultural Products	
6. Inspection, Enforcement, Regulation, and Control	
7. Purchasing	

	Major Functions	Major Activities
	*1. Supervision of Personnel	*1. Directing the efforts of others
		*2. Orienting new employees to their jobs
		*3. Training new employees
		*4. Improving worker performance and stimulating growth
		5. Hearing and processing worker grievances
		6. Informing personnel regarding firm policy, plans
		7. Evaluating personnel in terms of performance
VII. FOREMAN, GENERAL	2. Construction, Maintenance, Repair, and Operation of Agricultural Machinery	1. Setting up equipment for use
		2. Adjusting and calibrating field equipment for proper operation
DOT #407.131		3. Determining suitability of equipment for particular jobs
(N = 220, 8)		4. Operating large gas equipment
		5. Operating small gas equipment
	*3. Growing of Plants	*1. Soil tilling and land preparing
		*2. Controlling weeds, pests, and diseases
		*3. Irrigating and draining
		**4. Harvesting
	4. Administration and Management	
	*5. Purchasing	
	*6. Handling of Agricultural Materials	
	7. Clerical-Office	

VII. FARM/RANCH MANAGER

DOT #180.167
(N = 253, 5\

Major Function:	Major Activities
**1. Supervision of Personnel	*1. Hiring and training new employees *2. Orienting new employees to their jobs *3. Retraining experienced employees *4. Directing the efforts of others *5. Terminating employment of workers when necessary
*2. Construction, Maintenance, Repair, and Operation of Agricultural Machinery	*1. Maintaining and minor repairing of small and large gas engines *2. Maintaining diesel engines *3. Operating small and large gas engine equipment *4. Designing equipment *5. Setting up equipment for use
*3. Growing of Plants	*1. Soil tilling and land preparing *2. Controlling weeds, pests, and diseases *3. Irrigating and draining
4. Administration and Management	
5. Purchasing	
6. Handling of Agricultural Materials	
7. Clerical-Office	

	Major Functions	Major Activities
VII. FIELD REPRESENTATIVE, PROCESSING PLANT	*1. Consultation and Advisement	*1. Providing others with experience and information on operational and technical details regarding: a) production b) handling, transporting, marketing of agricultural products c) public relations d) accounts, records, bookkeeping, budgets
		*2. Identifying and taking inventory of resources
		*3. Recognizing limitations, problems, and obstacles
		*4. Establishing priorities
DOT #163.267 (N = 39, 11)	*2. Public Relations	*1. Meeting potential business associates socially
		*2. Determining effectiveness of efforts
		*3. Meeting and cooperating with others in developing solutions for agricultural problems
		*4. Engaging in informal public relations activities--providing non-business services to business associates
		*5. Planning, sponsoring, conducting meetings, seminars, discussions on agricultural topics
	*3. Growing of Plants	*1. Controlling weeds, pests, and diseases
		*2. Soil fertilizing--plant nutrition
		*3. Plant breeding, selecting, reproducing
		*4. Harvesting
		*5. Weather modifying for plant production
	*4. Supervision of Personnel	*1. Directing the efforts of others
		*2. Developing and maintaining a high level of morale
		*3. Hearing and processing the workers' grievances
		*4. Rating, evaluating personnel in terms of performance

		Major Functions	Major Activities
		*5. Research and Development	*1. Appraising the results of research *2. Recommending action as a result of evaluation
		*6. Inspection, Enforcement, Regulation, and Control	
VII.	FIELD REPRESENTATIVE, PROCESSING PLANT (Continued)	*7. Administration and Management	
	DOT #163.267 (N = 39, 11)	*8. Communications and Writing	

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	Major Functions	Major Activities
VII. MANAGER, PROCESSING PLANT AND AGRICULTURAL-RELATED BUSINESSES DOT #183.167 (N = 314, 14)	*1. Supervision of Personnel	*1. Evaluating personnel in terms of performance
		*2. Directing the efforts of others
		*3. Hearing and processing worker grievances
		4. Informing personnel of firm policy, plans
		5. Terminating employment of workers when necessary
		*6. Improving worker performance and stimulating growth
		*7. Orienting new employees to their jobs
		8. Interviewing prospective employees
		*9. Developing and maintaining a high level of morale
	*2. Administration and Management	*1. Organizing
		2. Coordinating
		*3. Planning
		*4. Evaluating
		5. Promoting
		*6. Making or formulating policy
		**7. Negotiating
	*3. Purchasing	*1. Determining needs
		*2. Choosing--selecting based on specification
		*3. Purchasing goods or procuring services
		4. Determining prices
		*5. Arranging for delivery
		6. Setting goals
	4. Processing and Packing of Agricultural Products	1. Interpreting laws, regulations, requirements
		2. Planning, setting goals, and objectives
		3. Trouble shooting problems as they arise
	*5. Construction, Maintenance, Repair, and Operation of Agricultural Machinery	*1. Setting up equipment for use
		*2. Determining suitability of equipment for particular jobs
		*3. Establishing and maintaining a record system for maintenance, service, operation, and repair

	Major Functions	Major Activities
	6. Public Relations	1. Meeting potential business associates socially 2. Determining what results are desired from involvement in public relations activities
	7. Handling of Agricultural Products	
VII. MANAGER, PROCESSING PLANT AND AGRICULTURAL RELATED BUSINESSES (Continued)	8. Sales	
	9. Growing of Plants	

DOT #183.167
(N = 314, 14)

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	Major Functions	Major Activities
	1. Sales	1. Acquiring product knowledge and skill competence
		2. Developing information regarding needs of customers
		3. Learning and using accepted selling techniques
		4. Providing for continued service, education, goodwill
		5. Advertising--displaying, exhibiting, publicizing
		6. Completing financial transactions
VII. PARTS MANAGER	*2. Purchasing	*1. Purchasing services and goods
		*2. Determining needs and specifications
DOT #185.167		*3. Choosing between alternatives
(N = 18, 3)		4. Setting goals--planning purchases, choosing actions
		5. Arranging for delivery
	*3. Supervision of Personnel	*1. Training new employees
		*2. Developing and maintaining a high level of morale
		*3. Improving worker performance and stimulating growth
		4. Evaluating personnel
		*5. Directing efforts of others
		*6. Interviewing prospective employees
	*4. Administration and Management	1. Making and formulating operating policy
		*2. Planning sales programs
		*3. Promoting programs
		*4. Coordinating
		**5. Organizing
	*5. Public Relations	*1. Formulating goals and objectives

VII. SERVICE MANAGER

DOT #187.167
(N = 19, 2)

Major Functions	Major Activities
*1. Supervision of Personnel	1. Informing personnel of firm policy, plans
	*2. Directing efforts of others
	3. Hearing and processing worker grievances
	*4. Improving level of worker performance and stimulating development
	5. Hiring new employees
	6. Evaluating worker performance
	7. Interviewing prospective employees
	8. Terminating employment of workers when necessary
	**9. Orienting new employees
	**10. Training new employees
2. Administration and Management	1. Planning
	2. Organizing
	3. Promoting
	4. Evaluating
	5. Coordinating
3. Purchasing	1. Purchasing
	2. Setting goals
	3. Determining needs
	4. Choosing between alternatives
4. Construction, Maintenance, Repair, and Operation of Agricultural Machinery	*1. Setting up equipment for use
	2. Determining suitability of equipment for particular jobs
	3. Establishing, maintaining a record system for service
	*4. Constructing equipment
	**5. Maintaining large gas engines and diesel engines
	**6. Performing major overhaul of gas and diesel engines
	**7. Adjusting and calibrating

VIII. PROFESSIONAL AGRICULTURAL PERSONNEL

VIII. PROFESSIONAL AGRICULTURAL PERSONNEL

Professional workers in agriculture complete the scope of occupational categories in this study. Although this category was not included in the previous study, its inclusion is necessary to give a complete picture of the various levels and types of occupations in agriculture.

Sixteen professional employees were interviewed representing the areas of engineering, developmental research, and plant sciences. Specific titles included: agronomist; engineer, agricultural; equipment designer; plant breeder; and research scientist, agricultural.

Professional-level jobs imply substantial educational preparation, and that was the case in the experience of these respondents. Thirteen of the sixteen had at least some graduate-level education. Only one had only a high-school diploma. Half indicated that graduate preparation was necessary for their job, and about half (44%) indicated that a four-year degree was adequate.

Fourteen of the 16 responded that education was a major factor in obtaining their present positions. Subject matter areas felt to be highly necessary for job entry were physical sciences, English, speech, biological sciences, and agricultural production.

Seventy-five percent of the professional employees expected changes in their job in the near future. Changes ranged from the effects of new technologies on equipment, greater use of computers in management decisions (planting schedules and product marketing), effects of new energy sources, to unforeseen changes brought about by research.

Job satisfaction was very high in this category, and all but one intended to remain in agriculture. Benefits cited by 50% or more of the respondents included paid vacation and holidays, health insurance, paid sick leave, and pension plans.

VIII. AGRONOMIST

DOT #040.061
(N = 10, 5)

Major Functions	Major Activities
*1. Consultation and Advisement	*1. Providing others with experience and information on operational and technical details regarding: a) research b) production c) agricultural business management d) human relations e) labor f) education
	*2. Setting goals and objectives
	*3. Determining ways and means in decision making
	*4. Recognizing limitations, problems and obstacles
	*5. Evaluating
	*6. Establishing priorities
	*7. Formulating policy
*2. Growing of Plants	*1. Soil tilling and land preparing
	*2. Propagating, planting, transplanting of plants
	*3. Irrigating and draining
	*4. Controlling weeds, pests, and diseases
	*5. Soil fertilizing--plant nutrition
	*6. Plant breeding, selecting, reproducing
	*7. Harvesting
*3. Administration and Management	*1. Making or formulating policy
	*2. Promoting
	*3. Planning
	*4. Coordinating
	*5. Evaluating
*4. Research and Development	
*5. Communications and Writing	

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VIII. **ENGINEER, AGRICULTURAL/
**EQUIPMENT DESIGNER

DOT #013.061
(N = 35, 6)

Major Functions	Major Activities
**1. Research and Development	**1. Identifying problem areas
	**2. Planning a course of action
	**3. Determining and assigning priorities
	**4. Selecting methods appropriate to investigation
	**5. Developing new techniques, procedures, and devices
	**6. Using physical, chemical, and biological principles and techniques to create new applications of service or product
	**7. Obtaining information relevant to particular situations, conditions, items, etc.
	**8. Making an examination, checking or testing against established standards
	**9. Appraising the results of research
**2. Construction, Maintenance, Repair, and Operation of Agricultural Machinery	**1. Designing equipment
	**2. Constructing equipment
	**3. Setting up equipment for use
	**4. Establishing and maintaining a record system for maintenance, service, etc.
**3. Consultation - Advisement	**1. Providing others with expertise and information on operational and technical details regarding: a) agricultural mechanics and engineering b) conserving, developing, and improving air, land, and water for agricultural purposes
	**3. Allocating and organizing resources
	**4. Evaluating
**4. Communications and Writing	**1. Writing reports for submission to higher authority
	**2. Gathering and recording field data

		Major Functions	Major Activities
		**1. Research and Development	**1. Identifying problem areas **2. Developing new techniques, procedures, and devices **3. Using physical, chemical, and biological principles and techniques **4. Obtaining pertinent information relevant to particular situations, conditions, items, circumstances **5. Making an examination, checking or testing against established standards
VIII.	**PLANT BREEDER/ RESEARCH SCIENTIST, AGRICULTURAL DOT #041.061/ DOT #040.061 (N = 19, 5)	**2. Growing of Plants	**1. Plant breeding, selecting and reproducing **2. Weather modifying for plant production **3. Propagating, planting, transplanting of plants
		**3. Consultation and Advisement	**1. Providing others with expertise and information on operational and technical details regarding production **2. Allocating and organizing resources **3. Determining ways and means **4. Defining purpose of program
		**4. Supervison of Personnel	**1. Interviewing and hiring new employees **2. Developing and maintaining a high level of morale **3. Hearing and processing worker grievances **4. Evaluating, rating personnel in terms of performance

Appendix A

ADDITIONAL JOB TITLES

1972 STUDY

The following job titles are found in "Functions and Activities Performed by Workers in Agriculture," Department of Applied Behavioral Sciences, U.C. Davis, 1972. These job titles were not included in the Yolo County study.

Additional Job Titles - 1972 Study

EQUIPMENT, OPERATION, MAINTENANCE, REPAIR PERSONNEL
- Equipment Repairman
- Fork Lift Operator
- Heavy Equipment Operator
- Parts Man
- Truck Driver, General

LANDSCAPE AND NURSERY WORKERS
- Budder
- Greenhouse Man
- City Park Employee
- Floral Designer
- Golf Course Worker
- Greensman
- Landscape Architect
- Landscape Gardner
- Plant Digger
- Propagator

LIVESTOCK WORKERS
- Artificial Inseminator
- Herdsman
- Horsetrainer
- Horseshoer
- Livestock Feeder
- Milking Machine Operator
- Veterinarian Assistant

MANAGERIAL AND SUPERVISORIAL PERSONNEL
- Assistant Foreman
- Assistant Manager
- Division Foreman
- Division Manager
- Personnel Manager
- Production Manager
- Superintendent
- Supervisor

OFFICE PERSONNEL
- Accountant

OWNER-OPERATORS (Category not used)
- Contractor, Farm Labor
- Cotton Farmer
- Dairy Farmer
- Deciduous Fruit and Nut Grower
- Farm Feed, Seed, Fertilizer, Insecticide Dealer
- Farm Machinery Dealer
- Field Crop Farmer
- Fresh Produce Dealer
- Nursery Owner-Operator
- Nursery Plant Grower
- Processing Plant Owner-Operator
- Service Company Owner-Operator
- Vegetable Farmer
- General Farmer

PROCESSING-PLANT WORKERS (Category not used)
- Butcher
- Dairy Plant Worker
- Processing Plant Worker
- Warehouseman

SALES PERSONNEL
- Fieldman
- Sales Manager
- Salesman, Store

Appendix B

FUNCTIONS AND ACTIVITIES - AGRICULTURAL OCCUPATIONS

Job functions as defined in this study are the kinds of actions proper to a person's normal work. Activities are the tasks conducted to carry out these actions. This system is a way of describing and classifying work. The following functions and activities sheets were used during interviews with agricultural employees. Activities for each function are listed in number sequence--a brief description of each activity is also included.

Appendix B

CONTENTS

I. Administration and Management

II. Supervision of Personnel

III. Consultation and Advisement

IV. Research and Development

V. Communications and Writing

VI. Sales

VII. Purchasing

VIII. Inspection, Enforcement, Regulation, and Control

IX. Education-Extension Work

X. Clerical-Office

XI. Public Relations

XII. Growing of Plants (Soil Preparation to Harvest)

XIII. Livestock and Poultry Production

XIV. Construction, Maintenance, Repair, and Operation of Agricultural Machinery, Equipment, and Facilities

XV. Handling of Agricultural Materials (Transference, Packaging, and Storage)

XVI. Processing and Packing of Agricultural Products

XVII. Marketing of Agricultural Products

XVIII. Development of Air, Land, and Water Resources

XIX. Environmental Horticulture (Landscape, Gardens, Flowers, Ornamentals)

XX. Forestry, Range, and Wildlife

XXI. Recreation, Parks, and Scenic Beauty

XXII. Finance and Lending

I. ADMINISTRATION AND MANAGEMENT

1. Making or formulating policy: Creating or developing governing principles, plans, or guidelines.
2. Promoting: Stimulating and encouraging programs, projects, and related activities.
3. Planning: Formulating goals, objectives, and guidelines for future action; devising, designing, and projecting methods, systems, manners, arrangements, ways and means.
4. Coordinating: Relating and integrating various aspects of programs and activities.
5. Organizing: Allocating resources and arranging elements into a functioning unit--systematizing.
6. Evaluating: Determining the value of--assessing, rating, judging.
7. Financing: Providing or arranging for funds, capital, or credit for firm or customers.
8. Negotiating: Conferring with another so as to arrive at the settlement of some matter--bargain, contract.

II. SUPERVISION OF PERSONNEL

1. Interviewing prospective employees.
2. Hiring new employees.
3. Orienting new employees to their jobs.
4. Training new employees.
5. Retraining experienced employees.
6. Directing the efforts of others.
7. Developing and maintaining a high level of morale.
8. Hearing and processing worker grievances.
9. Informing personnel regarding firm policy, plans.
10. Improving the level of worker performance and stimulating growth and development of workers.
11. Rating (evaluating) personnel in terms of performance.
12. Terminating employment of workers when necessary.

III. CONSULTATION AND ADVISEMENT

Providing others (in another firm or business) with expertise and information, recommending, informing, and counseling regarding:

A. Planning and decision-making (policies, procedures, programs, and techniques):

1. Formulating policy to guide overall actions.

III. CONSULTATION AND ADVISEMENT (CONTINUED)

A. Planning and decision-making (policies, procedures, programs, and techniques) (continued):

2. Defining purpose of program.
3. Setting goals and objectives.
4. Determining ways and means.
5. Identifying and taking inventory of resources (human, material, natural, capital).
6. Recognizing limitations, problems, and obstacles.
7. Establishing priorities.
8. Allocating and organizing resources.
9. Evaluating.

B. Knowing operational and technical details regarding:

10. Production.
11. Agricultural mechanics and engineering.
12. Handling, transporting, and marketing of agricultural products.
13. Conserving, developing, and improving air, land, and water for agricultural purposes.
14. Developing and maintaining rural recreation and aesthetic resources.
15. Agricultural business management.
16. Accounts, records, bookkeeping budgets.
17. Finance, credit, taxes, banking, insurance.
18. Public relations.
19. Human relations.
20. Labor.
21. Law.
22. Management.
23. Real estate.
24. Education.
25. Researching

IV. RESEARCH AND DEVELOPMENT

A. Identifying problems and setting goals of research:

1. Identifying problem areas.
2. Planning a course of action.

RESEARCH AND DEVELOPMENT (CONTINUED)

A. Identifying problems and setting goals of research (continued):

3. Preparing guidelines for research development.
4. Determining and assigning priorities.

B. Designing and developing the research proposal:

5. Identifying assumptions, presuppositions, value judgements implicit in the treatment of the problem.
6. Developing criteria of evaluation and of admissable evidence.
7. Selecting methods appropriate to investigation.
8. Determining the basis for selection and interpreting relation of data.

C. Conducting research:

9. Developing new techniques, procedures, and devices.
10. Using physical, chemical, and biological principles and techniques to create new applications of service or product.
11. Determining why there has been success or failure.
12. Seeing if something works by experiment or trial.
13. Identifying and recognizing various elements of situations, conditions, and circumstances.
14. Obtaining pertinent information relevant to particular situations, conditions, items and circumstances.
15. Determining the extent, size, nature, and value of.
16. Making an examination, checking or testing against established standards.
17. Making determinations by mathematical means.

D. Evaluating--critical study of ideas, materials, or methods involving appraising, rating, or examining; evaluating results:

18. Appraising the results of research.
19. Recommending action as a result of evaluation.

V. COMMUNICATIONS AND WRITING

A. Gathering, preparing, editing, and disseminating general agricultural information and news:

1. Written form--newspapers, magazines.
2. Audio form--radio, television, telephone, records, tapes.
3. Pictorial form--television, film strips, slides, movies, paintings, photographs, sketches, graphs.

B. Gathering, preparing, editing, submitting and disseminating technical agricultural information, findings, data, etc.:

4. Written form--reports and accounts; texts and reference books; circulars, pamphlets, brochures, and bulletins; articles for technical journals; study guides, outlines, handbooks, and training manuals.
5. Audio form--radio, television, telephone, records, tapes.
6. Pictorial form--television, film strips, slides, movies, paintings, photographs, sketches, overlays, graphs.

C. Gathering, preparing, editing, and submitting field data:

7. Gathering and recording field data.
8. Writing reports for submission to higher authority.

D. Making public talks, lectures, and educational visits:

9. Making public talks, lectures, and/or educational visits.

VI. SALES

A. Setting goals and developing sales program:

1. Planning a course of action.
2. Preparing guidelines for sales program.
3. Acquiring product knowledge or skill competence.

VI. SALES (CONTINUED)

A. Setting goals and developing sales program (continued):

4. Identifying target groups and individuals.
5. Developing information regarding prospective customers' needs for product or service.
6. Learning and using selling techniques based on accepted principles and practices.

B. Promoting and encouraging the adoption and use of specific goods and services:

7. Advertising--displaying, exhibiting, publicizing.
8. Demonstrating--showing, explaining, illustrating.
9. Estimating and interpreting the needs of the prospective buyer.
10. Diagnosing the opportunities for sales.

C. Closing the deal:

11. Completing financial transactions.
12. Providing for continued service, education, and goodwill.

D. Following-up and evaluating:

13. Checking on results obtained by customers.
14. Providing complete and acceptable records of sales program.

VII. PURCHASING

1. Setting goals: Planning a course of action for purchasing.
2. Determining needs: Identifying requirements and spelling out specifications of acceptability.
3. Choosing: Considering the alternatives and selecting according to specifications, rejecting sub-standard goods and services.
4. Purchasing: Procuring goods and services.
5. Determining: Estimating price based on market reports, grades, transportation differential, supplies, etc., and determining prices to offer.
6. Delivering: Arranging for delivery and mode of transportation.

VIII. INSPECTION, ENFORCEMENT, REGULATION, AND CONTROL

1. Inspecting: Examining agricultural products.
2. Standardizing agricultural products.
3. Controlling agricultural products.
4. Certifying agricultural products.
5. Quarantining of agricultural products.
6. Grading of agricultural products.
7. Analyzing agricultural programs.
8. Regulating agricultural programs.
9. Enforcing agricultural programs.
10. Researching agricultural programs.
11. Developing agricultural programs.
12. Administrating agricultural programs.
13. Promoting and protecting: Engaging in activities which enhance and safeguard California's agriculture.
14. Servicing: Providing California agriculturalists with specialized services.
15. Protecting the consumer: Guarding against deception and fraud by those who sell agricultural products and services.

IX. EDUCATION-EXTENSION WORK

A. Educating: Providing schooling, instruction, guidance and training

1. General education and citizenship training.
2. Vocational education.
3. Technical education.
4. Professional education.
5. In-service education (upgrading).
6. Retraining.
7. Avocational.
8. Training for disadvantaged, culturally deprived.

B. Extension work:

9. Transmitting research results to producers, handlers, consumers of farm products.
10. Conducting educational programs to increase the knowledge and improve the skills of California citizens.
11. Demonstrating and conducting adaptive research.

X. CLERICAL-OFFICE

1. Preparing correspondence and communications.
2. Preparing office reports, records, inventories.
3. Preparing financial accounts, books, budgets, and operating statements.
4. Keeping materials and production records.
5. Keeping employee records.
6. Duplicating and reproducing written or printed materials.
7. Operating office machines and communication devices.
8. Acting as receptionist and scheduling appointments.
9. Purchasing and/or requisitioning office supplies.
10. Engaging in office sales.
11. Handling money and making deposits.

XI. PUBLIC RELATIONS

A. Developing Public Relations Programs:

1. Determining what results are desired from involvement in public relations activities.
2. Formulating goals and objectives.
3. Deciding upon ways and means.
4. Taking inventory and allocating resources for effective public relations program.

B. Conducting Public Relations Program (promoting, publicizing):

5. Preparing and releasing information for dissemination by means of public communications media.
6. Preparing and releasing reports of activities and events including purpose, procedure used, and evaluation of results.
7. Making public appearances: Presenting talks, lectures, demonstrations.
8. Visiting agriculturalists in field of related endeavor and learning the relationships which exist.
9. Meeting and cooperating with others in developing solutions to agricultural problems.
10. Initiating, planning, sponsoring, and/or conducting meetings, seminars, conferences or discussions on appropriate topics.
11. Assisting in the promotion, preparation, distribution, and use of informational materials.

XI. PUBLIC RELATIONS (CONTINUED)

B. Conducting Public Relations Program (promoting, publicizing) (continued):

12. Recommending names of persons available as resource persons in agriculture.
13. Other.

C. Engaging in Informal Public Relations Activities:

14. Meeting potential business associates socially.
15. Providing non-business services to business associates.

D. Evaluating:

16. Determining effectiveness of efforts.

XII. GROWING OF PLANTS (Soil Preparation to Harvest)

1. Soil tilling and land preparing.
2. Propagating, planting, transplanting of plants.
3. Irrigating and draining.
4. Preventing, erradicating, and controlling weeds, pests, and diseases.
5. Pruning, thinning, and training.
6. Soil fertilizing--plant nutrition.
7. Plant breeding, selecting, reproducing.
8. Harvesting.
9. Weather modifying for plant production.

XIII. LIVESTOCK AND POULTRY PRODUCTION

1. Deciding on amounts and kinds of feed.
2. Feeding livestock.
3. Deciding on action to take for insects, disease, and parasite prevention, control and eradication.
4. Taking action to prevent, control, and eradicate insects, disease, and parasites.
5. Animal altering.

XIII. LIVESTOCK AND POULTRY PRODUCTION (CONTINUED)

6. Selecting breeding stock.
7. Providing breeding services.
8. Solving problems of physiology and reproduction.
9. Caring for livestock for meat production.
10. Caring for livestock for milk production.
11. Caring for livestock for wool production.
12. Caring for birds for egg production.
13. Training of livestock for special performance.
14. Cleaning of livestock facilities.
15. Building and/or maintaining livestock facilities.
16. Grooming and clipping livestock.
17. Providing specialized care for young livestock.
18. Milking cows.
19. Specializing in care of horses.

XIV. CONSTRUCTION, MAINTENANCE, REPAIR, AND OPERATION OF AGRICULTURAL MACHINERY, EQUIPMENT, AND FACILITIES

1. Maintaining and minor repairing of electrical motors.
2. Maintaining and minor repairing of small gas engines.
3. Maintaining large gas engines.
4. Maintaining diesel engines.
5. Performing major overhaul of diesel engines.
6. Performing major overhaul of gas engines.
7. Adjusting and calibrating field equipment for proper operation.
8. Operating small gas engine equipment.
9. Operating large gas engine equipment.
10. Operating diesel engine equipment.
11. Designing equipment.
12. Designing structures.
13. Constructing structures and facilities.
14. Constructing equipment.
15. Setting up equipment for use (install, establish, and service).
16. Determining suitability of equipment for particular jobs.
17. Establishing and maintaining a record system for maintenance, service, operation, and repair.

XV. HANDLING AGRICULTURAL MATERIALS (Transference, Packaging, and Storage)

A. Transferring of Agricultural Materials:

1. Conveying (continuous or intermittent forward movement--continuous drive).
2. Lifting and hoisting (reversing vertical or lateral movement).
3. Positioning, weighing, and controlling.
4. Transporting (carrier handling).

B. Packaging:

5. Packing of industrial products.
6. Packing of semifinished and finished products (including sorting of fruits and vegetables).

C. Storing and Warehousing:

7. Receiving.
8. Storing.
9. Shipping.

XVI. PROCESSING AND PACKING AGRICULTURAL PRODUCTS

1. Planning--setting goals and objectives, determining ways and means of processing program.
2. Interpreting USDA, state, local, and firm requirements, regulations, specifications, standards, controls, tests.

Performing such processing operations as:

3. Mixing, compounding, blending, kneading, shaping, and related work.
4. Separating, crushing, milling, chopping, grinding, and related work.
5. Culturing, melting, fermenting, distilling, saturating, pickling, aging, and related work.
6. Heating, rendering, melting, drying, cooling, freezing, and related work.
7. Slaughtering, breaking, curing, and related work.
8. Processing of food, tobacco, and related products not classified above.
9. Operating and adjusting all processing equipment and machinery.
10. Maintaining and servicing--keeping equipment in operational condition.
11. Trouble shooting problems as they arise.

XVI. PROCESSING AND PACKING AGRICULTURAL PRODUCTS (CONTINUED)

12. Keeping records, accounts, and reports of pertinent aspects of processing operation.
13. Analyzing and evaluating--reviewing results of program and recommending improvements.

XVII. MARKETING AGRICULTURAL PRODUCTS

1. Advertising agricultural products.
2. Retail selling of agricultural products.
3. Wholesale selling of agricultural products.
4. Forecasting prices of agricultural products.
5. Selecting market outlets for agricultural products.
6. Cooperative marketing--contract farming.

XVIII. DEVELOPMENT OF AIR, LAND, AND WATER RESOURCES

A. Developing water resources:

1. Planning irrigation systems.
2. Installing irrigation systems.
3. Servicing irrigation systems.
4. Constructing dams and/or ponds.
5. Planning drainage systems.
6. Constructing drainage systems.
7. Testing water quality.
8. Assessing water needs.
9. Measuring water use.

B. Developing land resources:

10. Surveying.
11. Land leveling.
12. Adjusting pH of soil.
13. Leaching of soil.
14. Assessing suitability of soil for various purposes.
15. Taking soil samples.
16. Testing soil.

XVIII. DEVELOPMENT OF AIR, LAND, AND WATER RESOURCES (CONTINUED)

C. Developing air resources:

17. Testing extent of pollution.
18. Testing effects of pollution.
19. Controlling pollution.

XIX. ENVIRONMENTAL HORTICULTURE (Landscape, gardens, flowers, ornamentals)

1. Growing of plants for ornamental horticultural use. (Ground cover, shrubs, flowers, trees, vines, succulents, cacti, turf, potted plants, bedding plants, bulbs.)
2. Operating and managing a greenhouse.
3. Using landscape architecture.
4. Landscape contracting.
5. Landscape designing.
6. Landscape gardening (locating, planting, maintaining).
7. Operating and managing a nursery.
8. Turf managing.
9. Caring for plants in containers outdoors.
10. Caring for plants in containers indoors.
11. Caring for cut plant material (including flowers).
12. Arranging cut plant materials.

XX. FORESTRY, RANGE, AND WILDLIFE

1. Surveying forest, range, and wildlife resources.
2. Propagating forest trees and range plants and reproducing wildlife.
3. Preserving, conserving, re-vegetating, stocking, and improving practices.
4. Developing recreational resources.
5. Utilizing and managing forest, range, and wildlife resources.
6. Protecting forest, range, and wildlife resources.

XXI. RECREATION, PARKS, AND SCENIC BEAUTY

A. Planning and designing of:

1. Arboretums, botanical gardens, and natural areas of scenic beauty.

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XXI. RECREATION, PARKS, AND SCENIC BEAUTY (CONTINUED)

A. Planning and designing of (continued):

2. Golf courses and other outdoor sports areas.
3. Parks, picnic areas, camp sites, and playgrounds.
4. Fishing areas.
5. Hunting areas.

B. Developing and establishing of:

6. Arboretums, botanical gardens and natural areas of scenic beauty.
7. Golf courses and other outdoor sports areas.
8. Parks, picnic areas, camp sites, and playgrounds.
9. Fishing areas.
10. Hunting areas.

C. Maintaining and upkeeping of:

11. Arboretums, botanical gardens and natural areas of scenic beauty.
12. Golf courses and other outdoor sports areas.
13. Parks, picnic areas, camp sites, and playgrounds.
14. Fishing areas.
15. Hunting areas.

D. Operating and managing of:

16. Arboretums, botanical gardens and natural areas of scenic beauty.
17. Golf courses and other outdoor sports areas.
18. Parks, picnic areas, camp sites, and playgrounds.
19. Fishing areas.
20. Hunting areas.

XXII. FINANCE AND LENDING

1. Preparing loans.
2. Recommending loans.
3. Approving loans.
4. Rejecting loans.
5. Appraising properties and chattels for security.